

TAXONOMIC OVERVIEW OF *HEDYOTIS NIGRICANS* (RUBIACEAE) AND CLOSELY ALLIED TAXA

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ABSTRACT

A taxonomic study of *Hedyotis nigricans* is rendered in which a widespread var. *nigricans* is recognized, along with five regional or localized, allopatric varieties: var. *floridana* (southern Florida); var. *pulvinata* (northeastern Florida); var. *austrotexana* B.L. Turner, var. nov. (southern Texas); var. *gypsophila* B.L. Turner, var. nov. (montane regions of Nuevo León, México and closely adjacent states); and var. *papillacea* B.L. Turner, var. nov. (northern panhandle and trans-Pecos, Texas, and closely adjacent New Mexico). A key to these taxa is provided along with maps showing their distributions. Additionally, these taxa are compared with the closely related species *H. angulata* and *H. butterwickiae*, and maps showing their distribution are also provided.

KEY WORDS: Rubiaceae, *Hedyotis*, *Houstonia*, systematics, Mexico, Texas

Hedyotis nigricans (Lam.) Fosberg (= *Houstonia nigricans* [Lam.] Fern.) has been variously treated as belonging to the genus *Hedyotis* or *Houstonia* (Shinners 1949; Terrell 1986, 1991), some workers preferring an inclusive *Hedyotis* (including *Houstonia*), others preferring a more restricted *Hedyotis* (excluding *Houstonia*, cf. Terrell 1991). Most current workers accept *Hedyotis nigricans* as belonging to *Hedyotis*, including Terrell (1991), albeit tentatively. Terrell (1986) provided a taxonomic overview of *H. nigricans* for the U.S.A., especially Florida, but did not treat in detail collections from Texas, New Mexico, and México.

The present contribution is based upon the detailed examination of over 800 sheets of *Hedyotis nigricans* on file at LL, TEX, and SRSC.

Key to Texas populations of *Hedyotis nigricans* and closely related taxa

1. Leaves mostly basal, very numerous and forming pulvinate mats, the stiffly erect rather naked stems having markedly appressed, stiff-lanceolate leaves; fruits mostly orbicular; southeastern most Brewster Co. *H. butterwickiae*

1. Leaves otherwise, mostly cauline and spreading; fruits mostly ovoid (except for Gulf Coastal populations); widespread.....(2)
2. Midstem leaves thick and short, ovate-linear to lanceolate, 1 cm long or less, the margins never enrolled; capsules orbicular at maturity; calyx lobes 1 mm long or less; rock or cliff-dwelling species of eastern trans-Pecos, Texas and closely adjacent México.....*H. angulata* Fosberg
2. Midstem leaves not as described in the above, the margins to some extent enrolling with dessication; capsules ovoid at maturity; calyx lobes mostly 1 mm or more long, if shorter then the leaves decidedly linear to linear-oblancoate; mostly not rock or bare-bluff species, widespread (*H. nigricans*).(3)
3. Calyx, and/or upper stems and leaves to some extent papillose with extended epidermal cells, these superficially resembling hairs, or else the calyx to some extent beset with callose hair-like enations.....(4)
3. Calyx, upper stems and leaves glabrous or merely ciliate along the leaf margins and calyx lobes.....var. *nigricans*
4. Plants mostly sprawling, low bushy herbs 5-15 cm high; panhandle and trans-Pecos Texas.....var. *papillacea*
4. Plants mostly simple-stemmed, non bushy herbs 20-40 cm high; southern Texas.....var. *austrotexana*

Key to Mexican populations of *Hedyotis nigricans*

1. Primary leaves at midstem mostly 1-3 mm wide, 3-12 times as long as wide; calyx usually glabrous, or with but a few ciliate hairs; mostly calcareous soils, widespread.....var. *nigricans*
1. Primary leaves at midstem mostly 3-6 mm wide, 2.5-3.5 times as long as wide; calyx usually markedly setose with thickened hairs; mostly gypseous soils of southernmost Coahuila, Nuevo León, and very closely adjacent Zacatecas and probably Tamaulipas.var. *gypsophila*

HEDYOTIS BUTTERWICKIAE (Terrell) Nesom, Syst. Bot. 13:434. 1988.
Houstonia butterwickiae Terrell

This species, first described by Terrell in 1979, was retained by both Nesom (1988) and Terrell (1991). It is known only by collections from along the ridgetop of the Bullis Range on the Bullis Gap Ranch, in Brewster Co., which is about 20 mi S of Sanderson (Terrell Co.). The taxon is obviously closely related to *Hedyotis nigricans* but can be immediately recognized by its very narrow, linear-lanceolate, relatively thickened stiffly ascending stem leaves, the basal leaves forming a dense pulvinate array of shorter, somewhat broader elliptic-lanceolate leaves. Additionally, Terrell, in his original description, notes that the taxon has nearly globose capsules and a relatively diffuse inflorescence.

HEDYOTIS NIGRICANS (Lam.) Fosberg, Lloydia 4:287. 1941.

Terrell (1986) treated this taxon as belonging to the genus *Houstonia* but subsequently (1991) positioned it in *Hedyotis*. He considered *H. nigricans* to be a "polymorphic species", but nevertheless recognized three varieties in the complex, a

widespread highly variable var. *nigricans*, and two very localized varieties in Florida, both coastal (Figure 1).

I have examined numerous sheets of this species from over a broad region and recognize three additional varietal taxa, as described below. All of these are largely allopatric with var. *nigricans* but appear to intergrade into the latter in regions of near contact.

Even with the removal of these several newly described elements, var. *nigricans* remains quite variable, ranging from rather spindly plants with linear to linear-oblongate leaves in eastern and central Texas, to shorter plants with linear-lanceolate to linear-elliptic leaves in west-central Texas and westwards. In México the variety, while quite variable, is less complex, as shown in Figure 2.

HEDYOTIS NIGRICANS var. *NIGRICANS*

Terrell (1986, 1991) accounted for most of the Texas names involved in the synonymy of this variety, and these are briefly touched upon here.

Houstonia salina A.A. Heller -This name is typified by material from coastal areas of southern Texas (Nueces Co.). I agree with Terrell (1986) that the plants concerned differ but little from typical elements of var. *nigricans*.

Houstonia tenuis Small -This name is typified by material from central Texas (San Saba Co.) and appears to be the same as var. *nigricans*, as noted by Terrell (1991).

Houstonia angustifolia Michx. var. *rigidiuscula* A Gray, Syn. Fl. N. Amer. 1(2):27. 1884. Shinnars (1949) transferred this variety into *Hedyotis nigricans* without comment, merely noting it to be typified by plants collected in "S. and W. Texas, Palmer, Havard, & c. Coast of E. Florida, Rugel. (Mex)". Unfortunately, to my knowledge, no one has lectotypified the name concerned, but my own evaluations of this appellation are that it was meant to apply to plants having a low rigid stature, mainly occurring in the southwestern U.S.A. (western Texas, New Mexico, and Arizona) and México. Those who might wish to apply this varietal name to such plants over this region might do so, but I view the variation between such habital forms as relatively trivial, there being gradual intergradation between such populational forms over a broad region of central Texas and northern México. In short, there seems little merit in attempting to define what the habital limits of var. *rigidiuscula* might be.

Houstonia angustifolia Michx. var. *scabra* S. Wats., Proc. Amer. Acad. Arts 18:97. 1883. (TYPE: MEXICO. Coahuila: Caracol Mts, 19-20 Aug 1880, E. Palmer 410; Isotype: LL!). -This name is unaccounted for by Terrell (1986, 1991) but examination of type material shows this to belong to var. *nigricans*. The Caracol Mts are said to be located about 24 mi southeast of Monclova, México (McVaugh 1956), an area well within the distribution of var. *nigricans* as defined in the present treatment.

HEDYOTIS NIGRICANS (Lam.) Fosberg var. **AUSTROTEXANA** B.L. Turner, var. nov. TYPE: U.S.A. Texas: Karnes Co., roadside 2 mi E of El Tejano Cafe, "dry sandy, clay soil", 22 Jun 1952, Joe C. Johnson 833 (LL).

H. nigricans (Lam.) Fosberg var. *austrotexana* B.L. Turner, var. nov.; similis *H. nigricans* var. *nigricans* sed calyces maturi valde papilloso ubique.

Resembling var. *nigricans* but the mature calyces markedly papillose throughout.

Other than having markedly papillose calyces, this taxon is essentially the same as var. *nigricans*; indeed, it apparently replaces the latter in the region shown in Figure 1. The two varieties do, however, grow in close proximity and occasional plants appear to show intergradation of the calyx character concerned in regions of near contact (e.g. Goliad Co.: *Smith 4271*; San Patricio Co.: *Turner 80-91M*).

HEDYOTIS NIGRICANS (Lam.) Fosberg var. **GYPSOPHILA** B.L. Turner, var. nov. TYPE: MEXICO. Nuevo León: Santa Rita, 2370 m, "Sparse pine woods - gypsum hillsides," 11 Jun 1981, *Hinton et al. 18278* (HOLOTYPE: TEX).

H. nigricans (Lam.) Fosberg var. *gypsophila* B.L. Turner, var. nov.; similis *H. nigricans* var. *nigricans* sed plantae parviores et ramosissimi e basi; folia ovato-elliptica et saepius 2.5-3.5 plo longiores quam latiores (vice folia linearia-lanceolata usque linearia-oblancoolata et saepius 4-20 plo longiora quam latiora); calyces maturi plerumque hispidi enatis capillaribus et latis basi (vice calyces glabros enatis infirme evolutis).

Resembling var. *nigricans* but the plants low and much-branched from the base, the leaves elliptic-ovate and mostly 2.5-3.5(4.0) times as long as wide (vs. linear-lanceolate to linear-oblancoolate, mostly 4-20 times as long as wide) and the mature calyces usually markedly hispid with broad-based hairs (vs. glabrous or merely minutely setose).

This taxon is represented by 45 or more collections at LL, TEX, mostly obtained from gypseous soils in the state of Nuevo León. While quite variable as concerns calyx pubescence, the branching habit and leaf shape is very diagnostic, and in combination the characters are as distinctive for recognition purposes as those characters in combination used by, for example, Terrell in his recognition of *Hedyotis nigricans* var. *pulvinata* (Small) Fosb., the latter superficially resembling var. *gypsophila* as conceived here.

HEDYOTIS NIGRICANS (Lam.) Fosberg var. **PAPILLACEA** B.L. Turner, var. nov. TYPE: U.S.A. New Mexico: Otero Co., northern McKittrick Canyon at first crossing of Texas-New Mexico boundary on the New Mexico side, "gravels and boulders of stream bottom. In Riparian type habitat and below protected cliffs; Big tooth maple, Ponderosa Pine, Madrone", etc. 8 Oct 1973, *Thomas F. Patterson 508* (HOLOTYPE: LL).

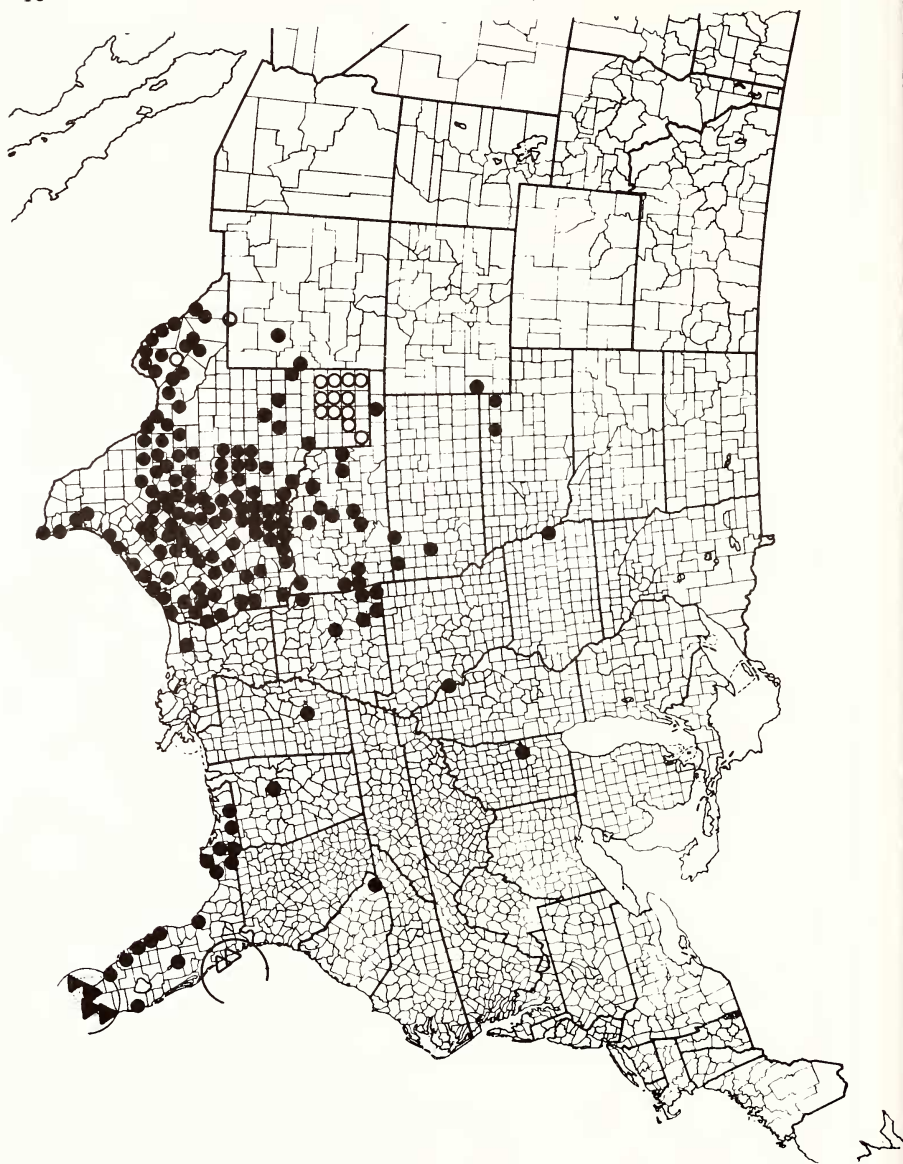


Figure 1. Distribution of *Hedyotis nigricans* in U.S.A.: var. *nigricans* (closed circles); var. *austrotexana* (diagonals); var. *floridana* (closed triangles); var. *papillacea* (open circles); var. *pulvinata* (open triangles).

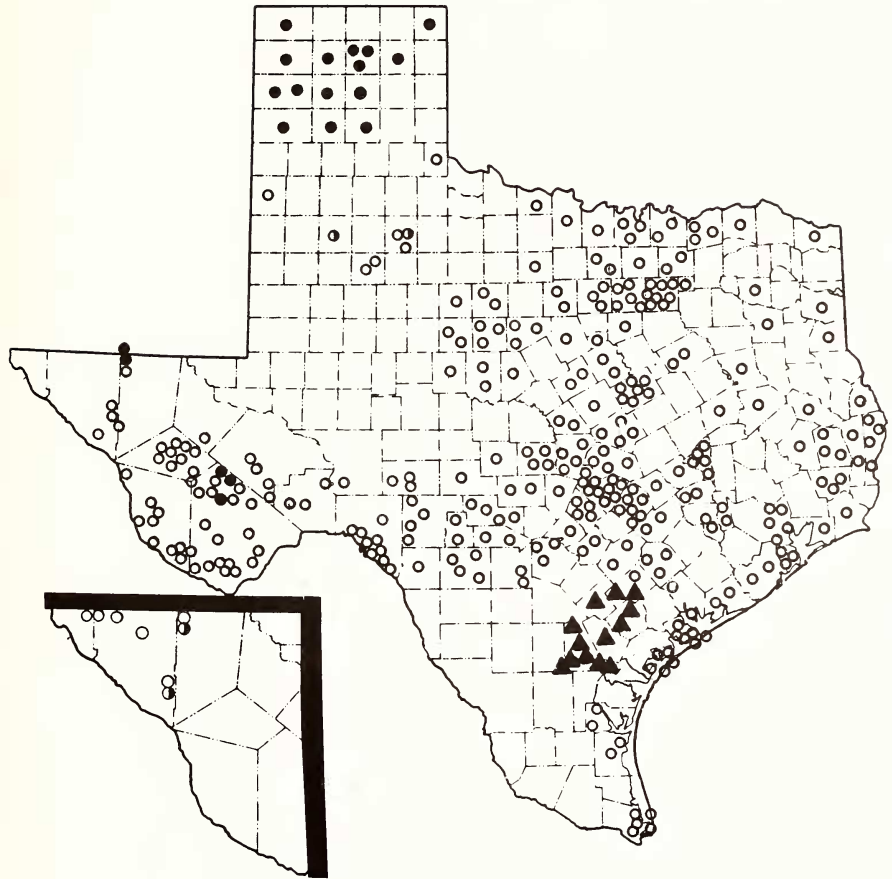


Figure 2. Distribution of *Hedyotis nigricans* complex in Texas: var. *nigricans* (open circles); var. *papillacea* (closed circles); \pm intermediates to var. *nigricans* and var. *papillacea* (half circles); var. *austrotexana* (triangles).

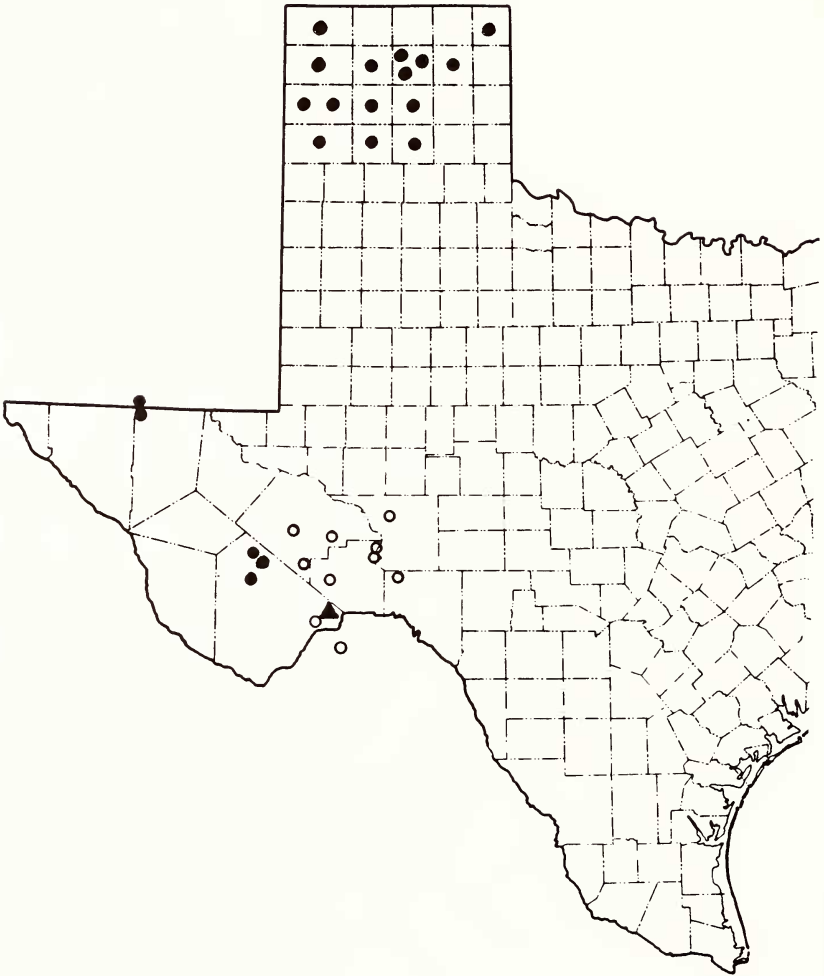


Figure 3. Distribution of *Hedyotis angulata* (open circles) and the superficially similar *H. nigricans* var. *papillacea* (closed circles); *H. butterwickiae* (triangle).



Figure 4. Distribution of *Hedyotis nigricans* in México: var. *nigricans* (open circles); var. *gypsophila* (closed circles); intermediates (half circles).

H. nigricans (Lam.) Fosberg var. *papillacea* B.L. Turner, var. nov.; similis *H. nigricans* var. *nigricans* sed saepius 5-15 cm alta, enascens caudicibus ramosis et ligneis; caules, folia, calycesque aliquantum papilloso enatis capillaribus.

Resembling var. *nigricans* but the plants mostly 5-15 cm high and the stems, leaves and calyces to some extent papillose with hair-like enations.

As shown in Figure 1, the var. *papillacea* is largely confined to the northernmost panhandle region of Texas where it passes, rather abruptly, into var. *nigricans*. It also is found in the trans-Pecos regions of Texas and closely adjacent New Mexico where it reportedly occurs in and along limestone ledges and bluffs (Del Norte, Glass and Guadalupe Mts). Plants of the latter region superficially resemble *Hedyotis angulata*, and some of these were annotated as such by Terrell (e.g., Warnock 7978, from the Del Norte Mts [TEX]). Inclusion of the panhandle collections with the trans-Pecos material might appear moot in that the panhandle collections have somewhat longer, more linear-lanceolate leaves and occur as populational disjuncts. However, similar populational disjunctions occur in several species of Asteraceae (e.g., *Chrysanthamnus*) and need not be cause for much concern, at least I find it difficult to distinguish between the two populational elements.

It should be noted that the type collection of var. *papillacea* was found growing with or near material that might be deemed to be var. *nigricans* (Patterson 508, 516) in that these two relatively late-flowering collections seemingly lack the papillose enations which characterize the taxon, but in all other characters these two plants resemble var. *papillacea* as conceived here. The same is true for occasional specimens from the panhandle region, where the variety is apparently much more common, to judge from herbarium collections.

Finally, it should be emphasized that from among the 1000 or more specimens of var. *nigricans* examined by me in the present study, only a few sheets were discerned to have papillose enations of the type found in var. *papillacea*, at least two of these from the state of Florida (Franklin Co., sand dunes and coastal areas along the Gulf of Mexico: Henderson 63-1309; Kral 39899). Obviously such enations are under relatively simple genetic control, but in the var. *papillacea* these appear to be populationally "fixed" in the regions shown in Figure 1, occurring on plants with a habital display quite different from the habital display of var. *nigricans* over most of its eastern distribution.

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